

## C L A I M S

What is claimed and desired to be secured by Letters Patent is as follows:

1. A biologically inactive metal interbody device for placement between a pair of adjacent vertebrae; said device comprising:
  - a) a body having an axis and upper and lower elongate convex surfaces that are generally coaxially located with respect to said axis and which are cylindrical in shape along a substantial length of said device; said upper and lower surfaces having elongate side edges;
  - b) said body also having arced concave side surfaces along a substantial length thereof; said side surfaces extending between respective side edges of said upper and lower surfaces; and
  - c) said device being formed of a metallic material which is biologically inactive.
2. The device according to Claim 1 wherein:
  - a) said side surfaces have a semi-circular cross-section in a plane passing perpendicular to said axis.

3. The device according to Claim 1 wherein:
  - a) both of said side surfaces have a common radius of generation.
4. The device according to Claim 3 wherein:
  - a) said upper and lower surfaces have a radius of generation approximately equal to said side surfaces common radius of generation.
5. The device according to Claim 1 wherein:
  - a) said upper and lower surfaces have a helically wound discontinuous thread located thereon.
6. The device according to Claim 1 wherein:
  - a) said thread extends from a rear to near a front of said device.
7. The device according to Claim 6 wherein:
  - a) said thread has a maximum and minimum diameter therealong and said minimum diameter approximately equals said maximum diameter in two forward turns of said thread so as to provide a generally smooth cylindrical surface for anterior bone support.

8. The device according to Claim 1 wherein:
  - a) said device has a front wall; and
  - b) said front wall includes a centrally located recess adapted to receive a bar for connecting together a pair of said devices.
9. The device according to Claim 8 in combination with said bar.
10. The combination according to Claim 9 wherein:
  - a) said recess has upper and lower walls and;
  - b) said bar is sized and shaped to snugly abut against said recess walls when placed in said recess so as to resist relative rotation between said bar and said device.
11. The combination according to Claim 10 wherein:
  - a) said bar includes a bore and said device includes a threaded bore such that both of said bores align when said bar is received in said slot.

12. The combination according to Claim 11 including:
- a) a set screw sized and shaped to be received through said bar bore and threaded to be matingly received in said device threaded bore to operably secure said bar to said device.
13. A biologically inactive metal interbody device for placement between a pair of adjacent vertebrae; said device comprising:
- a) a body having an axis and upper and lower elongate surfaces that are generally coaxially located with respect to said axis; said upper and lower surfaces having elongate side edges; said upper and lower surfaces each having a thread located thereon;
  - b) said thread has a generally uniform thread depth except near a front of said device whereat said thread depth is reduced;
  - c) said body also having inwardly arced side surfaces; said side surfaces extending between respective side edges of said upper and lower surfaces; and
  - d) said device being formed of a metallic material which is biologically inactive.

14. In a threaded interbody device for placement between a pair of adjacent vertebrae having an axis of rotation with upper and lower outer surfaces with threads thereon adapted to operably engage respective vertebrae and a pair of concave cylindrically shaped side surfaces joining respective outer edges of said lower and upper surfaces; the improvement comprising wherein:
- a) each of said upper and lower surfaces are sectors of a cylinder substantially along the entire length of said device and have a convex circular cross-section in a plane perpendicular to said axis; and
  - b) said device is formed of a metallic material which is biologically inactive.
15. A biologically inactive non-metal interbody device for placement between a pair of adjacent vertebrae; said device comprising:
- a) a body having an axis and upper and lower elongate convex surfaces that are generally coaxially located with respect to said axis and which are cylindrical in shape along a substantial length of said device; said upper and lower surfaces having elongate side edges;
  - b) said body also having arced concave side surfaces

along a substantial length thereof; said side surfaces extending between respective side edges of said upper and lower surfaces; and

c) said device is formed from a non-metallic material which is biologically inactive.

16. The device according to Claim 15 wherein:

a) said side surfaces have a semi-circular cross-section in a plane passing perpendicular to said axis.

17. The device according to Claim 15 wherein:

a) both of said side surfaces have a common radius of generation.

18. The device according to Claim 17 wherein:

a) said upper and lower surfaces have a radius of generation approximately equal to said side surfaces common radius of generation.

19. The device according to Claim 15 wherein:

a) said upper and lower surfaces have a helically wound discontinuous thread located thereon.

20. The device according to Claim 15 wherein:
- a) said thread extends from a rear to near a front of said device.
21. The device according to Claim 20 wherein:
- a) said thread has a maximum and minimum diameter therealong and said minimum diameter approximately equals said maximum diameter in two forward turns of said thread so as to provide a generally smooth cylindrical surface for anterior bone support.
22. The device according to Claim 15 wherein:
- a) said device has a front wall; and
  - b) said front wall includes a centrally located recess adapted to receive a bar for connecting together a pair of said devices.
23. The device according to Claim 22 in combination with said bar.
24. The combination according to Claim 23 wherein:
- a) said recess has upper and lower walls and;
  - b) said bar is sized and shaped to snugly abut

against said recess walls when placed in said recess so as to resist relative rotation between said bar and said device.

25. The combination according to Claim 24 wherein:

a) said bar includes a bore and said device includes a threaded bore such that both of said bores align when said bar is received in said slot.

26. The combination according to Claim 25 including:

a) a set screw sized and shaped to be received through said bar bore and threaded to be matingly received in said device threaded bore to operably secure said bar to said device.

27. A biologically inactive non-metal interbody device for placement between a pair of adjacent vertebrae; said device comprising:

a) a body having an axis and upper and lower elongate surfaces that are generally coaxially located with respect to said axis; said upper and lower surfaces having elongate side edges; said upper and lower surfaces each having a thread located thereon;



- b) said thread has a generally uniform thread depth except near a front of said device whereat said thread depth is reduced;
- c) said body also having inwardly arced side surfaces; said side surfaces extending between respective side edges of said upper and lower surfaces; and
- d) said device is formed of a non-metallic material which is biologically inactive.

28. In a threaded interbody device for placement between a pair of adjacent vertebrae having an axis of rotation with upper and lower outer surfaces with threads thereon adapted to operably engage respective vertebrae and a pair of concave cylindrically shaped side surfaces joining respective outer edges of said lower and upper surfaces; the improvement comprising wherein:
- a) each of said upper and lower surfaces are sectors of a cylinder substantially along the entire length of said device and have a convex circular cross-section in a plane perpendicular to said axis; and
  - b) said device is formed of a non-metallic material which

is biologically inactive.

29. A biologically active bone-based interbody device for placement between a pair of adjacent vertebrae; said device comprising:
  - a) a body having an axis and upper and lower elongate convex surfaces that are generally coaxially located with respect to said axis and which are cylindrical in shape along a substantial length of said device; said upper and lower surfaces having elongate side edges;
  - b) said body also having arced concave side surfaces along a substantial length thereof; said side surfaces extending between respective side edges of said upper and lower surfaces; and
  - c) said device being formed from a bone-based material which is biologically active.
30. The device according to Claim 29 wherein:
  - a) said side surfaces have a semi-circular cross-section in a plane passing perpendicular to said axis.
31. The device according to Claim 29 wherein:
  - a) both of said side surfaces have a common radius of

generation.

32. The device according to Claim 31 wherein:

a) said upper and lower surfaces have a radius of generation approximately equal to said side surfaces common radius of generation.

33. The device according to Claim 29 wherein:

a) said upper and lower surfaces have a helically wound discontinuous thread located thereon.

34. The device according to Claim 29 wherein:

a) said thread extends from a rear to near a front of said device.

35. The device according to Claim 34 wherein:

a) said thread has a maximum and minimum diameter therealong and said minimum diameter approximately equals said maximum diameter in two forward turns of said thread so as to provide a generally smooth cylindrical surface for anterior bone support.

36. The device according to Claim 29 wherein:

- a) said device has a front wall; and
- b) said front wall includes a centrally located recess adapted to receive a bar for connecting together a pair of said devices.

37. The device according to Claim 36 in combination with said bar.

38. The combination according to Claim 37 wherein:

- a) said recess has upper and lower walls and;
- b) said bar is sized and shaped to snugly abut against said recess walls when placed in said recess so as to resist relative rotation between said bar and said device.

39. The combination according to Claim 38 wherein:

- a) said bar includes a bore and said device includes a threaded bore such that both of said bores align when said bar is received in said slot.

40. The combination according to Claim 39 including:
- a) a set screw sized and shaped to be received through said bar bore and threaded to be matingly received in said device threaded bore to operably secure said bar to said device.
41. A biologically active bone-based interbody device for placement between a pair of adjacent vertebrae; said device comprising:
- a) a body having an axis and upper and lower elongate surfaces that are generally coaxially located with respect to said axis; said upper and lower surfaces having elongate side edges; said upper and lower surfaces each having a thread located thereon;
  - b) said thread has a generally uniform thread depth except near a front of said device whereat said thread depth is reduced;
  - c) said body also having inwardly arced side surfaces; said side surfaces extending between respective side edges of said upper and lower surfaces; and
  - d) said device is formed from a bone-based material which is biologically active.

42. In a threaded interbody device for placement between a pair of adjacent vertebrae having an axis of rotation with upper and lower outer surfaces with threads thereon adapted to operably engage respective vertebrae and a pair of concave cylindrically shaped side surfaces joining respective outer edges of said lower and upper surfaces; the improvement comprising wherein:
- a) each of said upper and lower surfaces are sectors of a cylinder substantially along the entire length of said device and have a convex circular cross-section in a plane perpendicular to said axis; and
  - b) said device is formed from a bone-based material which is biologically active.
43. A biologically active non-bone based interbody device for placement between a pair of adjacent vertebrae; said device comprising:
- a) a body having an axis and upper and lower elongate convex surfaces that are generally coaxially located with respect to said axis and which are cylindrical in shape along a substantial length of said device; said upper and lower surfaces having elongate side edges;
  - b) said body also having arced concave side surfaces

along a substantial length thereof; said side surfaces extending between respective side edges of said upper and lower surfaces; and

c) said device being formed from a non-bone based material which is biologically active.

44. The device according to Claim 43 wherein:

a) said side surfaces have a semi-circular cross-section in a plane passing perpendicular to said axis.

45. The device according to Claim 43 wherein:

a) both of said side surfaces have a common radius of generation.

46. The device according to Claim 45 wherein:

a) said upper and lower surfaces have a radius of generation approximately equal to said side surfaces common radius of generation.

47. The device according to Claim 43 wherein:

a) said upper and lower surfaces have a helically wound discontinuous thread located thereon.

48. The device according to Claim 43 wherein:
- a) said thread extends from a rear to near a front of said device.
49. The device according to Claim 48 wherein:
- a) said thread has a maximum and minimum diameter therealong and said minimum diameter approximately equals said maximum diameter in two forward turns of said thread so as to provide a generally smooth cylindrical surface for anterior bone support.
50. The device according to Claim 43 wherein:
- a) said device has a front wall; and
  - b) said front wall includes a centrally located recess adapted to receive a bar for connecting together a pair of said devices.
51. The device according to Claim 50 in combination with said bar.
52. The combination according to Claim 51 wherein:
- a) said recess has upper and lower walls and;
  - b) said bar is sized and shaped to snugly abut



against said recess walls when placed in said recess so as to resist relative rotation between said bar and said device.

53. The combination according to Claim 52 wherein:

a) said bar includes a bore and said device includes a threaded bore such that both of said bores align when said bar is received in said slot.

54. The combination according to Claim 53 including:

a) a set screw sized and shaped to be received through said bar bore and threaded to be matingly received in said device threaded bore to operably secure said bar to said device.

55. A biologically active non-bone based interbody device for placement between a pair of adjacent vertebrae; said device comprising:

a) a body having an axis and upper and lower elongate surfaces that are generally coaxially located with respect to said axis; said upper and lower surfaces having elongate side edges; said upper and lower surfaces each having a thread located thereon;

- b) said thread has a generally uniform thread depth except near a front of said device whereat said thread depth is reduced;
- c) said body also having inwardly arced side surfaces; said side surfaces extending between respective side edges of said upper and lower surfaces; and
- d) said device is formed from a non-bone based material which is biologically active.

56. In a threaded interbody device for placement between a pair of adjacent vertebrae having an axis of rotation with upper and lower outer surfaces with threads thereon adapted to operably engage respective vertebrae and a pair of concave cylindrically shaped side surfaces joining respective outer edges of said lower and upper surfaces; the improvement comprising wherein:
- a) each of said upper and lower surfaces are sectors of a cylinder substantially along the entire length of said device and have a convex circular cross-section in a plane perpendicular to said axis; and
  - b) said device is formed from a non-bone based material which is biologically active.